CELL SEPARATION

Stress-Free Cell Separation

For You and Your Cells

Total Lymphocytes

T cells

$CD4^+$ T cells

$CD8^+$ T cells

T cell subsets

B cells

Plasma cells

NK cells

Lymphoid cells

Myeloid cells

Monocytes

Dendritic cells

Granulocytes

Basophils

Eosinophils

Neutrophils

Hematopoietic progenitors

Mesenchymal progenitors

Mammary cells

Tumor cells

and more ...

STEMCELL TECHNOLOGIES

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Fast and easy cell separation.

The EasySep® System

EasySep® is a powerful immunomagnetic cell separation platform that combines the specificity of monoclonal antibodies with the simplicity of a column-free magnetic system for the isolation of highly purified cells.

Fast and Easy

Cells are ready in as little as 20 minutes with no columns or washes.

High Cell Purities and Recoveries

Purities of up to 99% with high recovery can be achieved.

Functional Viable Cells

Gentle EasySep® cell separations allow for functional and biological studies.

Extremely Versatile

Perform positive or negative selection of virtually any cell type from any single cell suspension or species.

Any Sample Source

Isolate cells directly from any sample source, including whole blood.

Flow Cytometry-Compatible

Isolated cells are immediately available for downstream analysis.

Isolate Virtually Any Cell Type with Purities of up to 99%, Including:

- Total lymphocytes
- T cells
- $CD4^+$ T cells
- $CD8^+$ T cells
- T cell subsets
- Regulatory T cells
- B cells
- B cell subsets
- Plasma cells
- NK cells
- Lymphoid cells
- Myeloid cells
- Monocytes
- Dendritic cells
- Granulocytes
- Basophils
- Eosinophils
- Neutrophils
- Hematopoietic progenitors
- Mesenchymal progenitors
- Mammary cells
- Tumor cells
- and more...

To see EasySep® in action
please visit www.easysep.com

For a complete list of EasySep® Products, see page 13 – 15.

How EasySep® Works

1 Add EasySep® selection cocktail

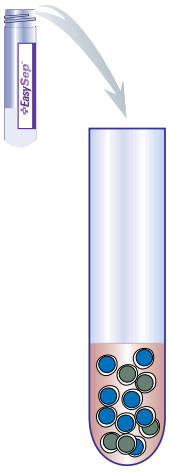
The EasySep® cocktail targets cells for selection or depletion (positive or negative selection) using Tetrameric Antibody Complexes (TAC). The TAC contain monoclonal antibodies directed against specific cell surface antigens.

2 Add EasySep® magnetic particles

EasySep® magnetic particles bind to labeled cells.

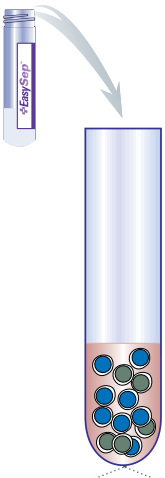
3 Place tube in magnet for 2.5 - 10 minutes

The magnetic field pulls the cells to the walls of the tube.



Cell Suspension

Incubate **10 - 15** minutes



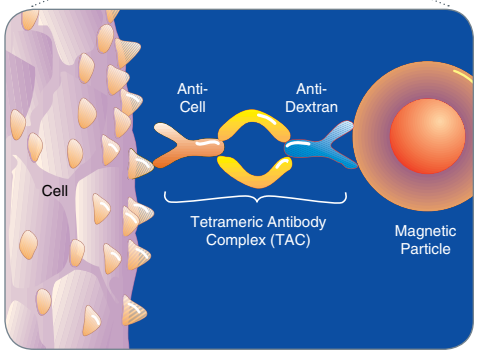
No Columns!

Incubate 5 minutes

4 Collect cells accordingly

Negative Selection: Cells of interest are poured off untouched, without having been labeled with antibodies or magnetic particles.

Positive Selection: Desired cells are labeled with magnetic particles and thus remain in the magnet.Unlike the magnetic particles used in other positive selection systems, EasySep® magnetic particles do not interfere with flow cytometry.



EasySep® kits contain:

- EasySep® selection cocktail
- EasySep® magnetic particles

EasySep® Magnet	Catalog #18000

The EasySep® Magnet is designed to hold one 12 x 75 mm (5 mL) polystyrene tube to isolate up to 2.5 x 10^8 cells (or up to 5 x 10^8 cells when isolating rare cells [e.g. $CD34^+$]) per separation.

"The Big Easy" EasySep® Magnet	Catalog #18001

"The Big Easy" EasySep® Magnet is designed to hold one 17 x 100 mm (14 mL) polystyrene tube to isolate up to 10^9 cells (or up to 2 x 10^9 cells when isolating rare cells [e.g. $CD34^+$]) per separation.

Untouched Human Cells

By Negative Selection

EasySep® is the ideal cell separation tool for the isolation of untouched human cells. Our Human Cell Enrichment Kits have been proven to isolate highly purified cells that are immediately available for downstream assays.

Fast, Easy, and Gentle

Isolate cells without columns or washes.

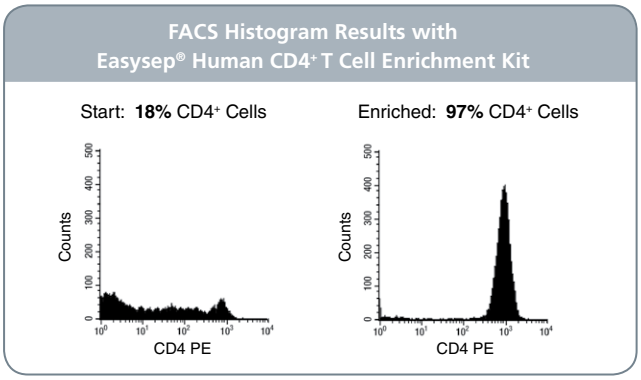
High Purity

Get purities of up to 99%.

Untouched Cells

Use cells immediately in functional studies.

EasySep® Human CD4+ T Cell Enrichment Kit (Catalog #19052)



Starting with frozen mononuclear cells, the CD4+ T cell content of the enriched fraction typically ranges from 92% - 97%.

Products for Research In:

Infectious Diseases

Isolate **CD4+ T cells (#19052)**, **CD8+ T cells (#19053)**, and **monocytes (#19059)** with minimal sample handling.

Cancer Immunology

Get high recovery of highly purified **NK cells (#19055)** to study tumor immunosurveillance.

Allergy and Inflammation

Isolate **basophils (#19069)**, **eosinophils (#19256)**, and **neutrophils (#19257)** without activation or degranulation.

Autoimmunity

Isolate functional and viable **regulatory T cells (#15862)** to study immune regulation and suppression.

For more products including our wide range of Human Positive Selection kits, please see pages 13 – 15.

"Easy 50" EasySep® Magnet **Catalog #18002**

The "Easy 50" EasySep® Magnet is designed to hold one 30 x 115 mm (50 mL) conical tube to isolate up to 4 x 10^9 cells by negative selection from whole blood, leukapheresis products or mouse splenocytes (or 2 x 10^9 cells from PBMC) per separation.

EasySep® Multistand **Catalog #18010**

Separate up to 4 samples at once using the EasySep® Multistand. The multistand is designed to hold up to 4 EasySep® Magnets or 4 "The Big Easy" EasySep® Magnets.

Mouse Cell Separation

EasySep® is available in a wide range of kits to isolate mouse cells from any source, including bone marrow, lymph nodes, spleen and whole blood. EasySep® Mouse Negative Enrichment Kits give you untouched, viable cells which are ideal for in vivo, ex vivo and adoptive transfer studies. Negative selection of mouse cells uses biotinylated antibodies to target unwanted cells, while positive selection uses PE-conjugated antibodies to select cells of interest.

Easy and Gentle

Isolate cells without columns or washes.

Convenient

Use isolated cells immediately in downstream applications.

High Purity

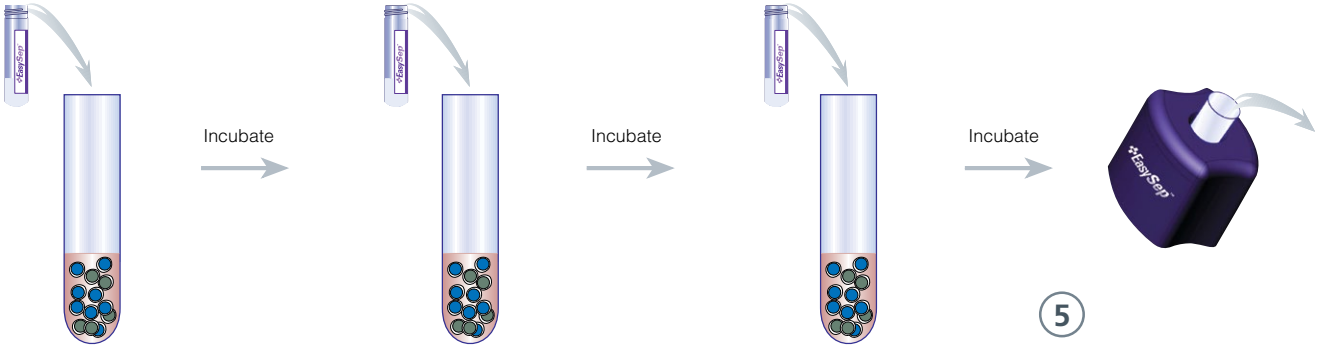
Get purities of up to 99%.

1 **Add biotin- (negative selection) or PE- (positive selection) labeled antibodies to a single cell suspension**

2 **Add EasySep® Biotin Selection Cocktail (negative selection) or EasySep® PE Selection Cocktail (positive selection)**

3 **Add EasySep® magnetic particles**

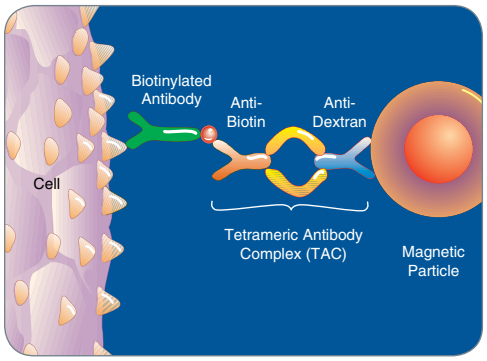
4 **Place tube in magnet for 2.5 - 10 minutes**



5 **Collect cells accordingly**

Negative Selection: desired cells are poured off into a new tube.

Positive Selection: desired cells remain in tube.



Schematic Drawing of EasySep® Magnetic Labeling of Mouse Cells for Negative Selection

Unwanted cells are specifically labeled with magnetic particles using biotinylated antibodies against cell surface antigens expressed on the unwanted cells, and bispecific Tetrameric Antibody Complexes (TAC). These complexes recognize both the surface of the magnetic particles and biotin.

Kits are available for the positive selection of mouse cells, which provide highly purified labeled cells that are immediately available for flow cytometry. Please see page 15.

Customized Selection

Of Virtually Any Cell Type from Any Species

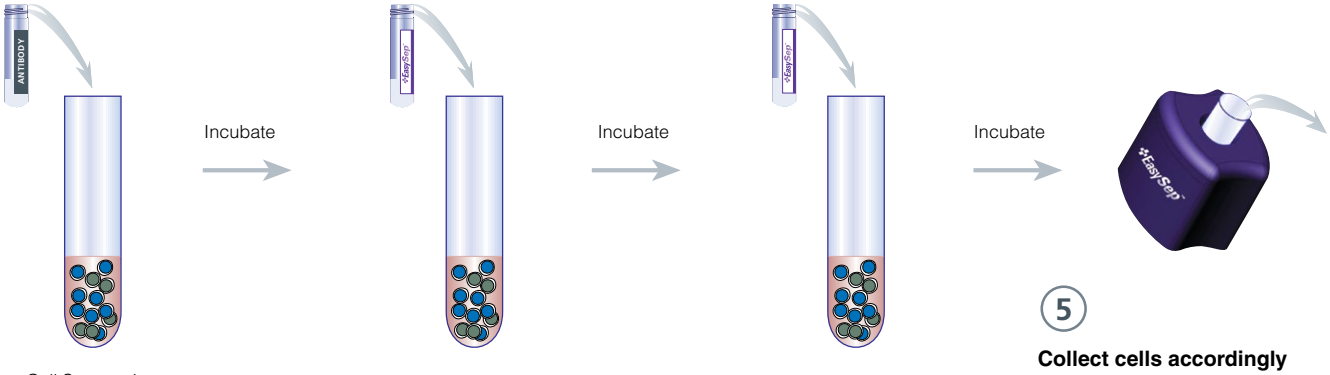
Highly purified cells from any species can be obtained by targeting the cells of interest with monoclonal antibodies to specific cell surface antigens. Use your own biotin-, PE-, APC- or FITC-conjugated antibody, or any mouse IgG_1 antibody, directed against a cell surface antigen on your cell of interest. The labeled cell suspension is then mixed with the appropriate EasySep® selection reagent and the standard EasySep® procedure is followed.

1 **Add your own antibody to a single cell suspension**

2 **Add EasySep® selection cocktail**

3 **Add EasySep® magnetic particles**

4 **Place tube in magnet for 5 minutes**



Cell Suspension

5 **Collect cells accordingly**

Negative Selection: desired cells are poured off into a new tube.

Positive Selection: desired cells remain in tube.

Use Your Own Labeled Antibody

Use **any conjugated antibody** with EasySep® PE, Biotin, FITC or APC Selection Kits to select or deplete your cells of interest.

Use Your Own Mouse IgG_1 Antibody

Use **any mouse IgG_1 anti-cell antibody** with the EasySep® "Do-It-Yourself" Selection Kit to select or deplete your cells of interest.

Design Your Own Custom Cocktail

Contact us at **info@stemcell.com** to discuss your specific cell separation requirements. We have a wide range of antibodies which can be easily incorporated into a Custom Selection Kit to address your unique applications.

For a complete listing of EasySep® products, see pages 13 – 15.

ROBOSEP®

The Fully Automated Cell Separator

RoboSep® is the **first** instrument to offer true walk-away automation of immunomagnetic cell separation, by performing all EasySep® cell labeling and magnetic separation steps. Just load your samples and reagents and return to separated cells in as little as 25 minutes.

High Throughput

Labels and separates up to 4 samples simultaneously.

Versatile

Positive or negative selection of virtually any cell type from any species or source, including whole blood.

Fast and Efficient

Cells are immediately available for flow cytometry, functional studies, or downstream analysis.

Capacity:

Positive selection:
processes up to 8 x 10^9 total cells
(4 samples of up to 2 x 10^9 cells each).

Negative selection:
processes up to 4 x 10^9 total cells
(4 samples of up to 1 x 10^9 cells each).

Negative and positive selections can be executed simultaneously.

Sample volume:
from 250 µL to 8.5 mL per sample.

To see RoboSep® in action
please visit www.robosep.com

Why Choose RoboSep®?

Reduce "Hands-On" Time

In a busy lab with samples arriving daily, technician time is at a premium. RoboSep® can process up to 32 samples in an average working day, with only 2 - 5 minutes of "hands-on" time per isolation.

Eliminate Sample Contamination

Some cell separation systems feature multi-use columns and tubing, increasing the risk of cross-contamination. RoboSep® uses disposable tips in a column-free system to prevent sample cross-contamination.

Minimize Sample Handling

Researchers who handle biological samples risk exposure to dangerous pathogens. RoboSep® fully automates all sample processing steps, reducing potential risk.

CUSTOMER TESTIMONIALS

KIM HENDERSON WORKS AT A LARGE CLINICAL LAB IN THE MIDWESTERN UNITED STATES AND WAS ONE OF THE FIRST RESEARCHERS TO PURCHASE A ROBOSEP® UNIT.

"We get up to eight samples a day that we sort for CD138+ cells. These cells are for different studies at the clinic and have to be processed the same day. Using our old system it would take up to 30 minutes per sample because of the volume and we'd have to be there all the time to load, unload and clean the machine. Now we can run four samples at once and have our enriched cells in an hour. RoboSep® uses dedicated pipette tips for each sample so there's no issue with cross-contamination. Because the process is all automated we can get other things done in the meantime. It makes our job a lot easier when we don't have to check the timer every ten minutes.

We're a busy lab and RoboSep® really saves us a lot of time."

WENDY LEONG, LAB MANAGER AT A PATHOLOGY/BLOOD CENTER LABORATORY

"We like the reliability of the RoboSep®, the minimization/elimination of specimen handling by the tech during subset separation, and the low maintenance of the instrument. These factors are important to us with such a high throughput of samples processed."

How RoboSep® Works

1 Select protocol

Load carousel with:

- samples
- EasySep® Selection Cocktail
- magnetic particles
- buffer and tips

2 Press “Run”

3 Return in 25 to 60 minutes to collect your separated cells

Applications

RoboSep® is the only fully automated cell separator that provides researchers with an efficient and easy-to-use option for the enrichment of cell populations for various downstream applications.

Whole Blood Processing

Label and separate up to 4.5 mL of blood per sample.

HIV

Minimize sample handling to reduce risk of exposure to dangerous pathogens.

HLA Labs

Cells are immediately available for any downstream HLA application including serology, flow cytometry crossmatch, and chimerism analysis.

Chimerism Analysis

Numerous selection strategies are available for sequential separation of multiple cell populations from a single patient sample.

Multiple Myeloma

Isolate $CD138^+$ cells with high purity from bone marrow, whole blood, and PBMC for accurate and reliable diagnostics.

Molecular Diagnostic Studies

Get highly purified cells for the extraction of high quality RNA and DNA.

Flow Cytometry Core Centers

Reduce time required on the flow cytometer when sorting for rare populations by pre-enriching cells.

Hematopoietic Stem and Progenitor Cells

Enrich rare stem and progenitor cell populations using a CD34 positive selection or lineage depletion strategy.

Custom Protocols

Use over 150 protocols specifically designed to select different cell populations or customize your own protocols for unique applications.

RoboSep® fits into a standard biocontainment hood for sterile operation.

Fully Automated Cell Separation

For Significant Time Savings

TYPE OF PROTOCOL		"HANDS-ON" TIME[1]	INSTRUMENT TIME[2]	TOTAL TIME
1 positive selection:	human mouse	2 min 2 min	48 - 60 min 69 - 77 min	50 - 62 min 71 - 79 min
1 negative selection:	human mouse	2 min 2 min	20 - 48 min 30 - 74 min	27 - 50 min 32 - 76 min
4 positive selections:	human mouse	5 min 5 min	64 - 78 min 86 - 103 min	69 - 83 min 91 - 108 min
2 or 4 negative selections[3]:	human mouse	5 min 5 min	20 - 51 min 41 - 77 min	36 - 56 min 46 - 82 min

1. "Hands-On" Time refers to the average length of set-up time required to load the instrument with samples and reagents, and to select one of the pre-programmed protocols.
2. Instrument Time is the length of time that RoboSep® requires to complete the cell separation(s).
3. Some negative selection protocols require two quadrants of the RoboSep® carousel; only two such protocols can be performed simultaneously.

System is Supplied With:

- RoboSep® Carousel
- Hydraulic Fluid Bottle
- One-Year Warranty
- RoboSep® Accessory Kit
  - 4 "The Big Easy" EasySep® Magnets
  - 2 Boxes of RoboSep® Tip Racks (16 Tip Racks in total)
  - RoboSep® Buffer (250 mL)
  - RoboSep® Service Rack
  - USB Keyboard
  - USB Mouse
  - USB Memory Stick
  - Magnet Shields
  - Tip Head Cleaners
  - User Manual
  - RoboSep® Timer
  - Quick Start Sheet

User Interface:

- Intuitive graphical user interface
- Integrated 8" color touch screen
- Pre-programmed protocols for EasySep® selection kits
- Stores and reports user ID, sample ID and reagent lot numbers
- Software and procedures can be updated, and usage data saved, through the Ethernet or USB connections
- Laboratory automation: can be controlled externally using XML-RPC for integration into automated processes

Technical Specifications:

Dimensions:

- Height with lid: 56 cm (21 7/8")
- Width: 71 cm (27 7/8")
- Depth: 39 cm (15 3/8")
- Weight: 26 kg (57 lb)

Power Requirements:

- 50/60 Hz, AC 100-240V
- Connections: RJ-45 10/100 Ethernet port, 2 USB ports

Conditions for Operation:

- Temperature: 10-30°C (50-86°F). RoboSep® is not specified for use in a cold room (4°C, 39°F)
- Humidity 20-85% (non-condensing)

Mechanical Components

Robotic Arm	Automated tip loading and ejection Dual tip head uses 1 mL and 5 mL tips Accurate pipetting range: 12.5 µL to 10 mL Air displacement pipetting
Ejection Arm	Automates tip ejection back into the tip rack without cross-contamination
Carousel	Can accommodate 4 "The Big Easy" EasySep® magnets Can accommodate up to 4 different samples
Hydraulics	Reliable pump requires no user-servicing Uses distilled water as hydraulic fluid, avoiding problems associated with salt crystal formation Easily accessible hydraulic fluid bottle with sufficient volume for several days of operation

RoboSep® & Accessories

PRODUCT NAME	CATALOG #
RoboSep®	20000
Additional One-Year Warranty	20200
Additional One-Year Warranty with Preventative Maintenance	20202
One Year Preventative Maintenance	20203
RoboSep® Service Rack	20101
Hydraulic Fluid Bottle	20102
RoboSep® Buffer (250 mL)1	20104
RoboSep® Buffer 5X Concentrate (250 mL)	20124
RoboSep® Filter Tip Racks (1 box of 8 racks)1	20125
EasySep® RBC Lysis Buffer 10X Concentrate (100 mL)2	20120
RoboSep® Tip Head Cleaner (7 mL)	20119
Ethernet Cross-Over Cable	20106
RoboSep® Carousel	20107
"The Big Easy" EasySep® Magnet	18001

1. 1 - 2 boxes of RoboSep® Tip Racks (each containing 8 individual racks) and 1 bottle of RoboSep® Buffer are included with every purchase of a RoboSep® Reagent Kit. Filter Tip Racks can be obtained by ordering a RoboSep® Filter Tip Reagent Kit (see pages 13 and 15).
2. 10 mL of 10X RBC Lysis Buffer is included with every purchase of an EasySep® or RoboSep® Whole Blood Selection Kit (see page 14).

Human **Negative Selection**

CELL TYPE	TISSUE[3]	TYPICAL PERFORMANCE DATA % PURITY[4]	EASYSEP® REAGENT KIT CATALOG #	ROBOSEP® FILTER TIP REAGENT KIT[1] CATALOG #	EASYSEP® STARTER KIT[2] CATALOG #
T Cells	PBMC	95 - 99	19051	19051RF	19041
$CD4^+$ T Cells	PBMC	92 - 97	19052	19052RF	19042
$CD4^+CD127^{low}$ T Cells	PBMC	92 - 96	19231	19231RF	-
Naïve $CD4^+$ T Cells	PBMC	91 - 95	19155	19155RF	19145
Memory $CD4^+$ T Cells	PBMC	86 - 98	19157	19157RF	19147
$CD8^+$ T Cells	PBMC	84 - 89	19053	19053RF	19043
B Cells	PBMC	95 - 99	19054	19054RF	19044
B Cells without CD43 Depletion[5]	PBMC	87 - 98	19154	19154RF	19144
Naive B Cells	PBMC	92 - 98	19254	19254RF	19244
NK Cells	PBMC	73 - 95	19055	19055RF	19045
Monocytes	PBMC	83 - 95	19059	19059RF	19049
Monocytes without CD16 Depletion	PBMC	73 - 81	19058	19058RF	19048
Pan-Dendritic Cells[6]	PBMC	40 - 80	19251	19251RF	19241
Plasmacytoid Dendritic Cells	PBMC	87 - 97	19062	19062RF	19032
Neutrophils	PMNC	98 - 99	19257	19257RF	-
Eosinophils	PMNC	86 - 99	19256	19256RF	19246
Basophils	PMNC	92 - 99	19069	19069RF	19039
Hematopoietic Progenitor Cells	BM	36 - 53	19056	19056RF	19046
Hematopoietic Progenitor Cells with CD41 Depletion	CB	39 - 75	19057	19057RF	19047
Human Custom Enrichment Kit	Isolate any human cell type by negative selection		19309	19309RF	-
EasySep® Combo Kit[7]	Contains any 3 standard enrichment kits and an EasySep® Magnet (18000)		-	-	19949

Human **Positive Selection**

CELL TYPE	TISSUE[3]	TYPICAL PERFORMANCE DATA % PURITY[4]	EASYSEP® REAGENT KIT CATALOG #	ROBOSEP® FILTER TIP REAGENT KIT[1] CATALOG #	EASYSEP® STARTER KIT[2] CATALOG #
$CD2^+$	PBMC	86 - 98	18657	18657RF	18647
$CD3^+$	PBMC	99 - 100	18051	18051RF	18041
$CD4^+$	PBMC	97 - 100	18052	18052RF	18042
$CD8^+$	PBMC	94 - 100	18053	18053RF	18043
$CD10^+$	Mammary	84 - 98	18358	-	18348
$CD14^+$	PBMC	98 - 100	18058	18058RF	18048
$CD19^+$	PBMC	97 - 99	18054	18054RF	18044
$CD4^+CD25^{high}$	WB	90 - 98	15862	15862RF	-
$CD4^+CD127^{low}CD25^+$	WB	84 - 93	15861	15861RF	-
$CD4^+CD127^{low}CD49d^-CD25^+$	WB	85 - 95	15864	15864RF	-
$CD25^{high}$	$CD4^+$ T cells[8]	90 - 98	18231	18221RF	-
$CD25^+$ (Custom Kit)	PBMC	90 - 96	18251	18251RF	18241
$CD33^+$	Lysed WB	93 - 97	18257	18257RF	18247
Myeloid ($CD33^+$ & $CD66b^+$)	PBMC	96 - 99	18653	18653RF	18643
$CD34^+$	Mobilized WB or PBMC	85 - 99	18056	18056RF	18046
	Frozen CB	84 - 99			
	Fresh CB	75 - 96	18096	18096RF	-
hES-Derived $CD34^+$	Differentiated hESC and hiPSC cell cultures	97	18167	-	18147
$CD45^+$ Depletion	PBMC	2.2 – 4.5 Log Depletion	18259	18259RF	18249
$CD56^+$	PBMC	86 - 98	18055	18055RF	18045
$CD138^+$ (Syndecan-1)	PBMC/BM	67 - 99	18357	18357RF	18347
$CD271^+$	BM	-	18659	-	-
$EpCAM^+$	Mammary	92 - 94	18356	18356RF	18346
$MUC1^+$	Mammary	96 - 98	18359	-	18349
Glycophorin A Depletion	WB/BM	2-4 Log Depletion	18352	18352RF	18342
PE Selection	Use with PE-conjugated antibodies		18551	18551RF	18541
PE Selection (Large)	Label Select $5x10^9$ Cells		18561	18561RF	-
FITC Selection	Use with FITC-conjugated antibodies		18552	18552RF	18542
Biotin Selection	Use with biotinylated antibodies		18553	18553RF	18543
APC Selection	Use with APC-conjugated antibodies		18451	18451RF	18441
"Do-It-Yourself" Selection	Use your own mouse IgG_1 antibody		18099	18099RF	18499
Human Custom Selection Kit	Isolate any human cell type by positive selection		18309	18309RF	-
EasySep® Combo Kit[7]	Contains any 3 standard selection kits and an EasySep® Magnet (18000)		-	-	18949

Each kit contains enough reagents to select desired cells from 10^9 total cells, except for the $CD34^+$ Positive Selection Kit, which can process up to 5 x 10^9 cells, the $CD25^{bright}$ selection kit, which can process up to 8 x 10^8 cells, and the Plasmacytoid Dendritic Cell Kit which can process up to 2 x 10^9 cells. Kits contain human Fc receptor blocker when necessary to prevent nonspecific binding.

1. RoboSep® Filter Tip Reagent Kits contain an EasySep® Selection Kit conveniently bundled with 1-2 boxes of RoboSep® Filter Tip Racks and a 250 mL bottle of RoboSep® Buffer.
2. EasySep® Starter Kits contain 3 standard kits and an EasySep® magnet (Catalog #18000).
3. BM - bone marrow; CB - cord blood; PBMC - peripheral blood mononuclear cells; PMNC - polymorphonuclear cells; WB - whole blood
4. Combined purity data of EasySep® and RoboSep® kits (when available).
5. Recommended for use with CLL and other abnormal samples
6. Pre-enrichment kit optimized for maximum cell recovery; subsequent cell sorting may be required.
7. Combo Kit must contain at least 2 different enrichment/selection kits.
8. RosetteSep® enriched (Catalog #15062)

Kits for **Whole Blood** Samples

CELL TYPE	TYPICAL PERFORMANCE DATA	EASYSEP® REAGENT KIT[1]	ROBOSEP® FILTER TIP REAGENT KIT[2]
	% PURITY[3]	CATALOG #	CATALOG #
CD2+	96 - 100	18687	18687RF
CD3+	98 - 100	18081	18081RF
CD4+	97 - 100	18082	18082RF
CD8+	97 - 100	18083	18083RF
CD14+[4]	97 - 100	18088	18088RF
CD15+	96 - 100	18681	18681RF
CD19+	94 - 100	18084	18084RF
CD20+	96 - 100	18685	18685RF
CD33+	82 - 97	18287	18287RF
CD34+[5]	52 - 90	18086	18086RF
Cord Blood CD34+	75 - 96	18096	18096RF
CD56+[4]	90 - 100	18085	18085RF
CD66b+	99 - 100	18682	18682RF
CD138+ (Syndecan-1)	89 - 98	18387	18387RF
Myeloid (CD33+ & CD66b+)	94 - 99	18683	18683RF
Lymphoid (CD3+ & CD19+)	98 - 100	18684	18684RF
CD45 Depletion[6]	2-4 log depletion	18289	18289RF

Kits for **HLA** Analysis

CELL TYPE		TYPICAL PERFORMANCE DATA	EASYSEP® REAGENT KIT[1]	ROBOSEP® FILTER TIPS REAGENT KIT[2]
	TISSUE[7]	% PURITY[3]	CATALOG #	CATALOG #
POSITIVE				
CD2+	PBMC	86 - 98	18657HLA	18657HLARF
	WB	96 - 100	18687HLA	18687HLARF
CD3+	PBMC	95 - 100	18051HLA	18051HLARF
	WB	93 - 99	18081HLA	18081HLARF
CD3+/CD19+	WB	98 - 100	18684HLA	18684HLARF
CD15+	WB	98 - 100	18681HLA	18681HLARF
CD19+	PBMC	97 - 99	18054	18054RF
	WB	94 - 100	18084	18084RF
CD19+/CD20+	PBMC	82 - 99	18454HLA	18454HLARF
	WB	86 - 97	18184HLA	18184HLARF
CD33+	PBMC	93 - 97	18257	18257RF
	WB	83 - 98	18287HLA	18287HLARF
CD33+/66b+	WB	94 - 99	18683HLA	18683HLARF
CD34+	PBMC	84 - 99	18056	18056RF
	WB	52 - 90	18086	18086RF
CD56+	PBMC	86 - 98	18055	18055RF
	WB	90 - 100	18085HLA	18085HLARF
CD66b+	WB	99 - 100	18682	18682RF
NEGATIVE				
Total Lymphocyte	WB	90 - 97	19961HLA	19961HLARF
T Cell	PBMC	95 - 99	19051HLA	19051HLARF
	WB	93 - 98	19951HLA	19951HLARF
B Cell	PBMC	95 - 99	19054HLA	19054HLARF
	WB	82 - 100	19954HLA	19954HLARF
DEPLETION				
Glycophorin A Depletion	PBMC	NA	18352	18352RF

Each kit contains enough reagents to process 60 mL of whole blood, unless otherwise stated.

1. EasySep® Reagent Kit contains a positive selection cocktail, magnetic particles, and a 10 mL bottle of EasySep® RBC Lysis Buffer* 10X concentrate.
2. RoboSep® Filter Tip Reagent Kit contains an EasySep® Selection Kit conveniently bundled with 1-2 boxes of RoboSep® Filter Tip Racks and a 250 mL bottle of RoboSep® Buffer.
3. Combined manual EasySep® and RoboSep® purity data.
4. For 30 mL of Buffy Coat.
5. For 75 mL of Whole Blood or 37.5 mL of Buffy Coat.
6. For up to 100 mL of Whole Blood. Contains HetaSep™ in place of EasySep® RBC Lysis Buffer 10X concentrate.
7. PBMC - peripheral blood mononuclear cells; WB - whole blood.
   *EasySep® RBC Lysis Buffer may be purchased separately (10X concentrate, 100 mL), Catalog #20120.

Mouse **Negative Selection**

CELL TYPE		TYPICAL PERFORMANCE DATA	EASYSEP® REAGENT KIT	ROBOSEP® FILTER TIP REAGENT KIT[1]	EASYSEP® STARTER KIT[2]
	TISSUE[3]	% PURITY[4]	CATALOG #	CATALOG #	CATALOG #
T Cells	Spleen	95 - 99	19751	19751RF	19741
CD4+ T Cells	Spleen	89 - 96	19752	19752RF	19742
CD8+ T Cells	Spleen	86 - 94	19753	19753RF	19743
B Cells	Spleen	91 - 96	19754	19754RF	19744
NK Cells	Spleen	75 - 87	19755	-	19745
Monocytes	BM	80 - 93	19761	19761RF	-
	WB	92 - 98			
Neutrophils	BM	80 - 90	19762	19762RF	19732
	WB	83 - 94			
Hematopoietic Progenitor Cells	BM	76 - 92	19756	19756RF	19746
Epithelial Cells	Epithelial	0.9 - 1.34% unwanted CD45, Ter119 and/or CD31 left	19758	-	-
Mammary Stem Cells[5]	Mammary Gland	1 Stem Cell per 20 - 90 Sorted Cells	19757	-	-
Mesenchymal Stem/Progenitor Cells	BM	50 - 99	19771	-	-
Mouse Custom Enrichment Kit	Isolate any mouse cell type by negative selection		19709	19709RF	-
EasySep® Combo Kit[6]	Contains any 3 standard enrichment kits and an EasySep® Magnet (18000)		-	-	19749

Mouse **Positive Selection**

CELL TYPE		TYPICAL PERFORMANCE DATA	EASYSEP® REAGENT KIT	ROBOSEP® FILTER TIP REAGENT KIT[1]	EASYSEP® STARTER KIT[2]
	TISSUE[3]	% PURITY[4]	CATALOG #	CATALOG #	CATALOG #
CD4+	Spleen	94 - 99	18752	18752RF	18742
CD4+CD25+	Spleen	85 - 97	19782	-	-
CD4+CD25+ (Large)[7]	Spleen	85 - 97	19792	-	-
CD8+	Spleen	90 - 98	18753	18753RF	18743
CD11b+	Spleen	92 - 96	18770	18770RF	18740
CD11c+	Cultured BM	87 - 98	18758	18758RF	18748
CD11c+ with Spleen Dissociation Medium	Spleen	87 - 98	18768	18768RF	18748
CD19+	Spleen	97 - 99	18754	18754RF	18744
CD25high	CD4+ T cells[8]	95 - 97	18761	-	-
CD49b+ (DX5)	Spleen	88 - 97	18755	18755RF	18745
CD90+ (Thy 1.2)	Spleen	96 - 99	18751	18751RF	18741
CD117+ (c-Kit+)	BM	88 - 95	18757	18757RF	18747
CD93+ (AA4.1)	BM	87 - 99	18762	18762RF	18732
	Fetal Liver	74 - 97			
SCA1+	BM	87 - 97	18756	18756RF	18746
SCA1 Biotin	BM	80 - 98	18856	18856RF	18846
PE Selection	Use with PE-conjugated antibodies		18554	18554RF	18544
PE Selection (Large)	Labels 5 x 10^9 cells		18564	18564RF	-
FITC Selection	Use with FITC-conjugated antibodies		18555	18555RF	18545
Biotin Selection	Use with biotinylated antibodies		18556	18556RF	18546
APC Selection	Use with APC-conjugated antibodies		18452	18452RF	18442
Mouse Custom Selection Kit	Isolate any mouse cell type by positive selection		18709	18709RF	-
EasySep® Combo Kit[6]	Contains any 3 standard selection kits and an EasySep® Magnet (18000)		-	-	18749

Other Species **Positive Selection**

PRODUCT NAME	DESCRIPTION	EASYSEP® REAGENT KIT	ROBOSEP® FILTER TIP REAGENT KIT[1]	EASYSEP® STARTER KIT[2]
		CATALOG #	CATALOG #	CATALOG #
PE Selection Kit	Use with PE-conjugated antibodies	18557	18557RF	18547
FITC Selection Kit	Use with FITC-conjugated antibodies	18558	18558RF	18548
Biotin Selection Kit	Use with biotinylated antibodies	18559	18559RF	18549
APC Selection Kit	Use with APC-conjugated antibodies	18453	18453RF	18443
"Do-It-Yourself" Selection Kit	Use your own mouse IgG_1 antibody	18098	18098RF	18498
Rat Custom Selection Kit	Isolate any rat cell type by positive selection	19609	-	-
Rhesus Custom Selection Kit	Isolate any non-human primate cell type by positive selection	19809	-	-

Mouse Positive Selection Kits contain enough reagents to select desired cells from 2 x 10^9 total cells, with the exception of the $CD25^{bright}$ Kit, $CD4^+CD25^+$ Regulatory T cell Kits and PE, FITC, Biotin and APC Selection Kits. Mouse Negative Selection Kits contain enough reagents to enrich desired cells from 10^9 total cells. Kits contain mouse Fc receptor blocker when necessary to prevent nonspecific binding. Other Species Positive Selection Kits contain enough reagents to select desired cells from 10^9 total cells.

1. RoboSep® Filter Tip Reagent Kits contain an EasySep® Selection Kit conveniently bundled with 1-2 boxes of RoboSep® Filter Tip Racks and a 250 mL bottle of RoboSep® Buffer.
2. EasySep® Starter Kits contain 3 standard kits and an EasySep® magnet (18000).
3. BM - bone marrow; WB - whole blood.
4. Combined purity data of EasySep® and RoboSep® kits (when available).
5. Kits contain pre-enrichment cocktail and two fluorescently-labeled antibodies for subsequent cell sorting.
6. Combo Kit must contain at least 2 different enrichment/selection kits.
7. Labels 4 x 10^9 total cells.
8. EasySep® enriched (Catalog #19772).

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Total Lymphocytes

T cells

$CD4^+$ T cells

$CD8^+$ T cells

T cell subsets

B cells

Plasma cells

NK cells

Lymphoid cells

Myeloid cells

Monocytes

Dendritic cells

Granulocytes

Basophils

Eosinophils

Neutrophils

Hematopoietic progenitors

Mesenchymal progenitors

Mammary cells

Tumor cells

and more ...

Advantages
High Purity of Rare Cells
Efficient
Flexible
Rapid and Simple
Superior Immunomagnetic Cell Labeling
StemSep™
A high performance system in which cells are immunomagnetically labeled & bound to a magnetic column
all species
all cell types
positive or negative selection

StemSep™

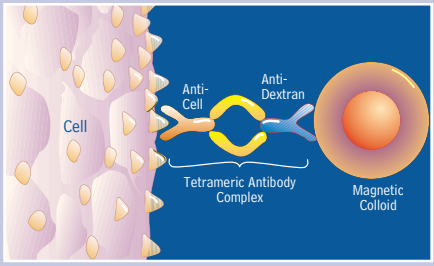
Immunomagnetic Negative or Positive Cell Selection

ALL SPECIES ALL CELL TYPES

HUMAN, RAT, OR NON-HUMAN PRIMATE

Human, rat or non-human primate cells are crosslinked to magnetic dextran iron particles using TAC (Tetrameric Antibody Complexes; Figure 1). TAC are comprised of two mouse IgG_1 monoclonal antibodies (shown in red & blue in Figure 1), held in tetrameric array by two rat anti-mouse IgG_1 monoclonal antibody molecules (shown in yellow in Figure 1). One mouse antibody molecule recognizes the cell surface antigen and the other recognizes the dextran on the magnetic colloid/nanoparticle. The cell suspension is then passed through a high-gradient column of stainless steel mesh which is placed in a magnet.

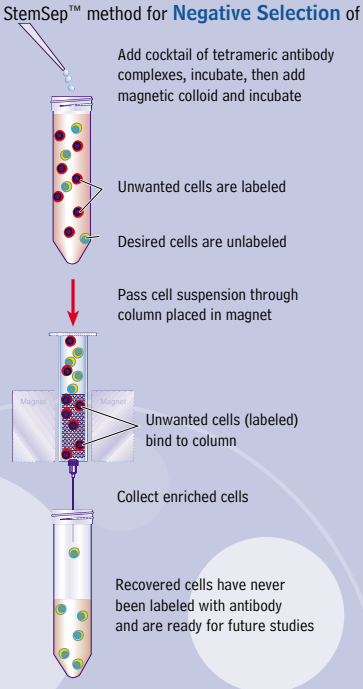
Figure 1. Schematic drawing of StemSep™ TAC magnetic labeling of human, rat or non-human primate cells



NEGATIVE SELECTION

The magnetically labeled unwanted cells bind to the column while the unlabeled enriched cells pass through untouched leaving them ready for further study.

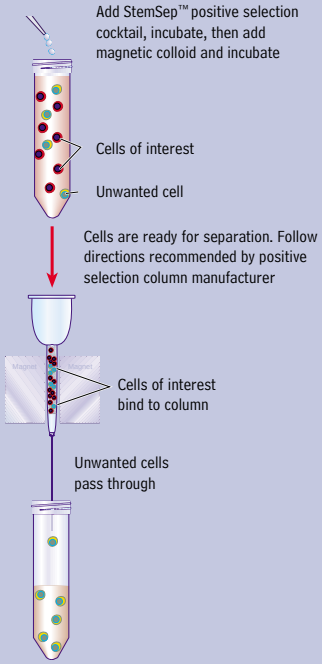
Figure 2.
StemSep™ method for Negative Selection of cells


Add cocktail of tetrameric antibody complexes, incubate, then add magnetic colloid and incubate
Unwanted cells are labeled
Desired cells are unlabeled
Pass cell suspension through column placed in magnet
Unwanted cells (labeled) bind to column
Collect enriched cells
Recovered cells have never been labeled with antibody and are ready for future studies

POSITIVE SELECTION

The magnetically labeled cells of interest bind to the column while the unlabeled cells pass through. Cells of interest are collected from the positive selection column according to manufacturer's instructions. The extremely tiny magnetic nanoparticles are completely FACS-compatible, and thus do not interfere with further studies

Figure 3.
StemSep™ method for Positive Selection of cells

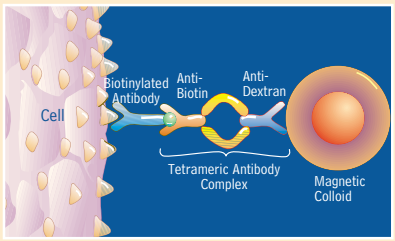

Add StemSep™ positive selection cocktail, incubate, then add magnetic colloid and incubate
Cells of interest
Unwanted cell
Cells are ready for separation. Follow directions recommended by positive selection column manufacturer
Cells of interest bind to column
Unwanted cells pass through

PLUS FOR ANY SPECIES: TRY A CUSTOM COCKTAIL OR USE THE STEMSEP™ PE OR BIOTIN TAC WITH YOUR OWN ANTIBODIES!

MOUSE

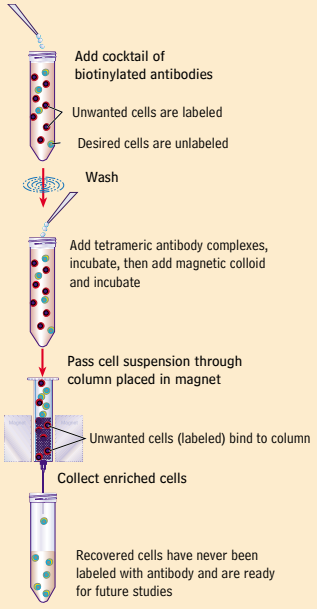
Mouse cells are magnetically labeled indirectly using a cocktail of biotinylated antibodies directed against cell surface markers on the unwanted cells (Figure 4). Cells are then crosslinked to magnetic dextran iron particles using TAC (Tetrameric Antibody Complexes). TAC are comprised of two mouse IgG_1 monoclonal antibodies held in tetrameric array by two rat anti-mouse IgG_1 monoclonal antibody molecules. One mouse antibody molecule recognizes biotin and the other recognizes dextran on the magnetic nanoparticle. The cell suspension is then passed through a high-gradient column of stainless steel mesh (Figure 5). The magnetically labeled unwanted cells bind to the column while the unlabeled enriched cells pass through.

Figure 4. Schematic drawing of StemSep™ TAC magnetic labeling of mouse cells



NEGATIVE SELECTION

Figure 5.
StemSep™ method for Negative Selection of mouse cells


Add cocktail of biotinylated antibodies
Unwanted cells are labeled
Desired cells are unlabeled
Wash
Add tetrameric antibody complexes, incubate, then add magnetic colloid and incubate
Pass cell suspension through column placed in magnet
Unwanted cells (labeled) bind to column
Collect enriched cells
Recovered cells have never been labeled with antibody and are ready for future studies

StemSep™

Equipment & Reagents

Magnets

Red Magnet with Stand

This device is designed to perform one gravity or pump feed separation with a StemSep™ 0.1" or 0.3" negative selection column. Depending on the column size, a range of 10^5 - 8 x 10^7 cells can be loaded per column.

Green Magnet with Stand

This device is designed to perform one gravity or pump feed separation with the following StemSep™ negative selection column sizes: 0.1", 0.3", 0.5" and 0.6". Depending on the column size, a range of 10^5 - 1.5 x 10^9 cells can be loaded per column.

Blue Magnet with Stand and Pump

This device is designed to perform up to four simultaneous separations with the following StemSep™ negative selection column sizes: 0.3", 0.5" and 0.6". Depending on the column size, a range of 2 x 10^7 -1.5 x 10^9 cells can be loaded per column. This magnet and stand can accommodate only pump feed columns.

Black Magnet with Stand and Pump

This device is designed to perform a single pump feed separation with a 1.0" bulk column. Optimally, 10^{10} cells can be processed with this column. This magnet and stand can also accommodate the following pump feed columns: 0.3", 0.5", 0.6" (and 1.0") giving a range of 2 x 10^7 - 1.5 x 10^{10} cells per separation.

Negative Selection Columns

- High-gradient magnetic columns comprised of stainless steel mesh
- High capacity columns designed for negative selection
- Pump (P) or gravity (G) feed
- Cell range from 10^5 to 1.5 x 10^{10} cells depending on the column
- Positive selection reagents are designed for use with commercially available magnetic positive cell selection columns

Columns are available in five sizes (optimal cell number/column*) 0.1" diameter (10^6 cells), 0.3" diameter (5 x 10^7 cells), 0.5" diameter (10^8 cells), 0.6" diameter (5 x 10^8 cells) and 1.0" diameter (10^{10} cells)

* Optimum cell number/column can be doubled when using ficolled cells

Reagents - Ultimate in Flexibility & Customization

- Positive or Negative Selection
- Human, mouse, rat, non-human primate, & more
- Compatible with other immunomagnetic column-based systems (0.5 Tesla magnet) including manual and automated systems
- Incorporate any mouse IgG_1 monoclonal antibody to create a customized TAC** cell separation reagent
- Use any biotinylated or PE-conjugated antibody with anti-biotin or anti-PE TAC**
- FACS-compatible magnetic nanoparticles
- A wide selection of antibodies are available for custom separations. Please contact us to discuss your needs

See next pages for composition of human (negative & positive selection) & mouse (negative selection) standard cocktails as well as suggested combinations of antibodies for particular cell subsets.

** Tetrameric Antibody Complexes

StemSep™

Immunomagnetic Mouse Cell Selection

Composition of Enrichment Cocktails*

StemSep™ Negative Selection Cocktails - target unwanted cells

Hematopoietic Stem/Progenitor Cell

Hematopoietic Progenitor Cocktail
CD5, CD11b, CD45R (B220), TER119, Ly-6G (Gr-1), Neutrophils (7-4)

Double Negative Thymocyte
⛔ T Cell Cocktail plus antibodies against: NK Cells, CD4, CD8, CD25

T Cell
⛔ CD11b, CD45R (B220) TER119, Ly-6G (Gr-1)

- **CD4⁺ T Cell**
  ⛔ CD8, CD11b, CD45R (B220) TER119, Ly-6G (Gr-1)
- **Naïve CD4⁺ T Cell**
  ⛔ CD4⁺ T Cell Cocktail plus antibodies against: NK Cells, CD44
- **Memory CD4⁺ T Cell**
  ⛔ CD4⁺ T Cell Cocktail plus antibodies against: NK Cells, CD62L
- **Resting CD4⁺ T Cell**
  ⛔ CD4⁺ T Cell Cocktail plus antibodies against: CD25

γδ T Cell
⛔ T Cell Cocktail plus antibodies against NK cells, TCRαβ

B Cell
⛔ CD4, CD8, CD11b, Ly-6G (Gr-1), TER119

NK Cell
⛔ CD5, CD22, F4/80, TER119, Ly-6G (Gr-1)

Dendritic Cell
⛔ CD2, CD3, CD19, TER119, Ly-6G (Gr-1), Neutrophils (7-4)

- **CD8⁺ T Cell**
  ⛔ CD4, CD11b, CD45R (B220), NK cells (DX5), TER119, Ly-6G (Gr-1)
- **Naïve CD8⁺ T Cell**
  ⛔ CD8⁺ T Cell Cocktail plus antibodies against: CD44
- **Memory CD8⁺ T Cell**
  ⛔ CD8⁺ T Cell Cocktail plus antibodies against: CD62L
- **Resting CD8⁺ T Cell**
  ⛔ CD8⁺ T Cell Cocktail plus antibodies against: CD25

** Biotinylated antibodies in standard negative selection cocktails are shown in blue.*
Biotinylated antibodies suggested for addition to a standard cocktail to enrich a particular cell subset are shown in red (custom cocktail).

StemSep™

Immunomagnetic Human Cell Selection

Composition of Cocktails*

StemSep™ Negative Selection Cocktails - target unwanted cells

StemSep™ Positive Selection Cocktails - target desired cells

Hematopoietic Stem/Progenitor Cell

Primitive Hematopoietic Progenitor Cocktail
⊖ CD2, CD3, CD14, CD16, CD19, CD24, CD36, CD38, CD45RA, CD56, CD66b, glycophorin A

Hematopoietic Progenitor Cocktail
⊖ CD2, CD3, CD14, CD16, CD19, CD24, CD56, CD66b, glycophorin A
⊕ CD34

Lymphoid Progenitor

T Cell
⊖ CD14, CD16, CD19, CD56, glycophorin A
⊕ CD3

B Cell
⊖ CD2, CD3, CD14, CD16, CD56, glycophorin A
⊕ CD19

NK Cell
⊖ CD3, CD4, CD14, CD19, CD66b glycophorin A
⊕ CD56

γδ T Cell
⊖ T cell cocktail plus: TCRαβ

αβ T Cell
⊖ T cell cocktail plus: TCRγδ

CD4⁺ T Cell
⊖ CD8, CD14, CD16, CD19, CD56, glycophorin A
⊕ CD4

CD4⁺ CD25⁺
Refer to RosetteSep™ & EasySep™ protocol

Naïve CD4⁺ T Cell
⊖ CD8, CD14, CD16, CD19, CD45RO, CD56, glycophorin A

antigen stimulation

Effector CD4⁺ T Cells

Th1
⊖ CD4⁺T cell cocktail plus one or more of: CD124 (IL-4R), CCR4, T1/ST2

Th2
⊖ CD4⁺T cell cocktail plus: IL-18rα

Memory CD4⁺ T Cell
⊖ CD4⁺T cell cocktail plus: CD45RA

Resting CD4⁺ T Cell
⊖ CD4⁺T cell cocktail plus one or more of: CD25, CD69, HLA-DR

CD8⁺ T Cell
⊖ CD4, CD14, CD16, CD19, CD56, glycophorin A
⊕ CD8

Naïve CD8⁺ T Cell
⊖ CD8⁺T cell cocktail plus: CD45RO

antigen stimulation

Effector CD8⁺ T Cells

Memory CD8⁺ T Cell
⊖ CD8⁺T cell cocktail plus: CD45RA

Resting CD8⁺ T Cell
⊖ CD8⁺T cell cocktail plus one or more of: CD25, CD69, HLA-DR

Myeloid Progenitor

Dendritic Cell
⊖ CD3, CD14, CD16, CD19, CD34, CD56, CD66b, glycophorin A

Monocyte
⊖ CD2, CD3, CD19, CD56, CD66b, glycophorin A
⊕ CD14

Granulocyte
⊖ CD2, CD3, CD14, CD19, CD56, glycophorin A

Eosinophil
⊖ CD2, CD14, CD16, CD19, CD56, glycophorin A
Use polymorphonuclear (PMN) cell-rich fraction

Neutrophil
⊖ Suggested custom cocktail: CD23, IgE
Use polymorphonuclear (PMN) cell-rich fraction

Basophil
⊖ CD2, CD3, CD14, CD15, CD16, CD19, CD24, CD34, CD36, CD45RA, CD56, glycophorin A

Other Enrichment Cocktails

Epithelial Tumor Cell
CD2, CD14, CD16, CD38, CD45, CD66b, glycophorin A

Human Cell Enrichment from Mouse/Human Chimeras
(anti-mouse) CD45, TER119

CML De-Bulking
CD2, CD3 CD14, CD15, CD16, CD19, CD24, CD56, CD66b, IgE, glycophorin A

Depletion Cocktails

CD3⁺ T Cell Depletion
CD3

CD8⁺ T Cell Depletion
CD8

Breast Carcinoma Depletion
5E11, BRST1

** Antibodies in standard negative selection cocktails are shown in blue.*
Antibodies in standard positive selection cocktails are shown in yellow.
Antibodies suggested for addition to a standard cocktail for the enrichment of a particular cell subset are shown in red (custom cocktail).

Antibody Cocktails

Cocktail to Enrich Cell Type	Human Negative Selection	Human Positive Selection	Mouse Negative Selection	Rat Negative Selection	Non-Human Primate Negative Selection
for labeling	1 x 10^9 cells (2 mL) 5 x 10^8 cells (10 mL)	1 x 10^9 cells (1 mL) [2 x 10^9 cells - 1 mL]	5 x 10^8 cells (0.1 mL) 1 x 10^9 cells (0.2 mL) 5 x 10^9 cells (1 mL)	5 x 10^8 cells (1 mL) 1 x 10^9 cells (2 mL) 5 x 10^9 cells (10 mL)	1 x 10^9 cells (2 mL) 5 x 10^9 cells (10 mL)
T cells	14051 14061	14751	13031 13051 13061	16031 16051 16061	16151 16161
CD4+ T cells	14052 14062	14752	13032 13052 13062	16032 16052 16062	16152 16162
Naïve CD4+ T cells	14155 14165				
CD8+ T cells	14053 14063	14753	13033 13053 13063	16033 16053 16063	16153 16163
B cells	14054 14064	14754	13034 13054 13064		
NK cells	14055 14065	14755	13035 13055 13065		
Dendritic cells	14153 14163		13037 13057 13067		
Hematopoietic Progenitors	14056 14066	[14756]	13036 13056 13066		
Primitive Hematopoietic Progenitors	14057 14067				
Monocytes	14058 14068	14758			
Custom	14309	14709	13309	16309	16109
T Cell Depletion	14651* 14661*				16251 16261
CD4 Depletion					16123
CD8 Depletion	14652* 14662*				16122
Breast Carcinoma Cell Depletion	14653* 14663*				
CML De-Bulking	14154* 14164*				
Human Cells from Mouse/Human Chimeras	13058 13068				
Basophils	14059 14069				
Eosinophils	14156 14166				
Granulocytes	14151* 14161*				
Epithelial Tumor Cells	14152 14162				

OPTIONS FOR ALL SPECIES

ANTI-BIOTIN TETRAMERIC ANTIBODY COMPLEXES (TAC)

Catalog Numbers:		
	13030	1 mL for labeling 5 x 10^8 cells
	13050	2 mL for labeling 1 x 10^9 cells
	13060	10 mL for labeling 5 x 10^9 cells

ANTI-R-PHYCOERYTHRIN (PE) TETRAMERIC ANTIBODY COMPLEXES (TAC)

Catalog Numbers:		
	13530	1 mL for labeling 5 x 10^8 cells
	13550	2 mL for labeling 1 x 10^9 cells
	13560	10 mL for labeling 5 x 10^9 cells

Negative Selection Columns

(Supplied in 10 column packs with the exception of the 1.0" column which is sold individually)

Catalog Number		Column Diameter	Optimum Cell Number per Column**	Will Fit Magnet Size
Gravity	Pump			
12021	12022	0.1"	1 x 10^6 cells	red, green
12031	12032	0.3"	5 x 10^7 cells	all sizes
12051	12052	0.5"	1 x 10^8 cells	green, blue, black
12061	12062	0.6"	5 x 10^8 cells	green, blue, black
-	12470	1.0"	1 x 10^{10} cells	black

**When using Ficolled cells, optimum cell number per column can be doubled.

Note: Not to be used for positive selection.

Magnets and Other Equipment

Catalog Number	Description	Pump or Gravity Feed	Number of Simultaneous Separations	Column Size
11030	red magnet and stand	gravity or pump	1	0.1" 0.3"
11050	green magnet and stand	gravity or pump	1	0.1", 0.3" 0.5", 0.6"
11060	blue magnet and stand	pump	1 to 4	0.3", 0.5" 0.6"
11070	black magnet and stand	pump	1	0.3", 0.5" 0.6", 1.0"
11000	peristaltic pump	-	1 to 4	0.1", 0.3", 0.5", 0.6" 1.0"

For a complete list of StemSep™ support products, please see our catalog or website <www.stemcell.com>

StemSep™ Advantage: TAC‡ Flexibility

Unlike other immunomagnetic cell separation systems, StemSep™ does not require coupling the anti-cell antibodies directly to magnetic particles. Instead, StemSep™utilizes flexible TAC technology. The colloidal paramagnetic nanoparticles used in StemSep™ are coated with dextran, allowing them to be bound by the anti-dextran end of any StemSep™ TAC reagent. Since the anti-cell end of a bi-specific TAC reagent can be varied, TAC can be easily customized by incorporating any cell-specific mouse IgG_1 monoclonal antibody, instantly creating a novel cell separation reagent. If a mouse IgG_1 monoclonal is not available for a particular cell surface antigen, we provide anti-biotin or anti-PE TAC, allowing the use of any biotinylated or PE-conjugated cell-specific antibodies in your separations. This flexibility of StemSep™ and our custom cocktail program have allowed many researchers to perform unique cell separations that would otherwise not have been possible.

‡ Tetrameric Antibody Complexes

*This product is available only as a custom order. Please contact us for more information.

www.stemcell.com

StemCell Technologies

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Fax: 1.604.877.0704
Toll Free Tel: 1.800.667.0322
Toll Free Fax: 1.800.567.2899
e-mail: info@stemcell.com
e-mail: orders@stemcell.com

In the United Kingdom
Tel: +44.(0).20.7537.7565
Fax: +44.(0).20.7515.5408
Toll Free within United Kingdom:
Tel: 0800.731.27.14
Fax: 0800.731.27.13
e-mail: info@stemcellgb.com
www.stemcellgb.com

In Europe
Tel: +33.(0).4.76.04.75.30
Fax: +33.(0).4.76.18.99.63
e-mail: info@stemcellfrance.com

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Czech Republic, 420.56.730.26.81; Denmark, +44.20.7537.7565; Finland, +44.20.7537.7565;
France, +33.(0).4.76.04.75.30; Germany, 02644.9512.0; Greece, +30.231.032.2525;
Iceland, +44.20.7537.7565; India, +91.11.2622.7801; Ireland, +44.(0).20.7537.7565;
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Switzerland, 61.712.11.15; Taiwan, 02.2365.6266; Turkey, 90.216.327.12.35;
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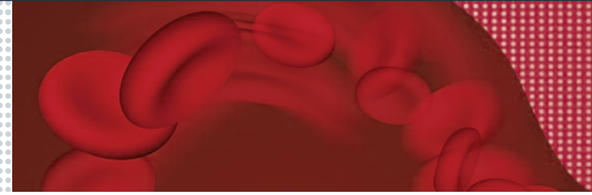

RosetteSep®

POWERFUL CELL SEPARATION
WITH A SIMPLE SPIN

RosetteSep® PRODUCT LISTING

Human Negative Selection

CELL ENRICHMENT COCKTAILS	CATALOG #	
	TO LABEL 40 ML OF BLOOD	TO LABEL 200 ML OF BLOOD
T Cells	15021	15061
$CD4^+$ T Cells	15022	15062
$CD8^+$ T Cells	15023	15063
$CD4^+CD25^+$ Regulatory T Cells	-	15862
B Cells	15024	15064
NK Cells	15025	15065
Total Lymphocytes	15223	15263
Monocytes	15028	15068
Granulocytes**	15121	15161
Progenitor Cells from Cord Blood	15026	15066
De-Bulking Cord Blood for Freezing	15126	15166
Progenitor Cells from Bone Marrow	15027	15067
Mesenchymal Stem Cells from Bone Marrow	15128	15168
Multiple Myeloma (B and Plasma) Cells from Bone Marrow	15129	15169
Circulating Epithelial Tumor Cells (Extensive Enrichment)	15127	15167
Circulating Epithelial Tumor Cells (CD45 Depletion)	15122	15162
Any Cells (Custom)	15309	-
CELL DEPLETION COCKTAILS*	**TO LABEL 40 ML OF BLOOD**	**TO LABEL 200 ML OF BLOOD**
$CD3^+$ Cell Depletion	15621	15661
$CD4^+$ Cell Depletion	15622	15662
$CD8^+$ Cell Depletion	15623	15663
Granulocyte Depletion (CD66b)	15624	15664
Monocyte Depletion (CD36)	15628	15668
IgE Depletion	15230	-
HLA COCKTAILS	**TO LABEL 250 ML OF BLOOD**	**TO LABEL 1000 ML OF BLOOD**
T Cell Enrichment	15061HLA	15081HLA
B Cell Enrichment	15064HLA	15084HLA
Total Lymphocyte Enrichment	15263HLA	15283HLA
Lymphoid Enrichment	15271HLA	-
Myeloid Enrichment	15272HLA	-
Granulocyte Depletion	15664HLA	15684HLA
SUPPORT REAGENTS	**CATALOG #**	
	100 ML	500 ML
Ficoll-Paque™ Plus	07907	07957
RosetteSep® DM-L	15705	-
RosetteSep® DM-M	15725	-
HetaSep®	07906	-

*Can be added to a standard RosetteSep® cocktail, if not already present
**Kit contains the required density medium

RosetteSep® CUSTOM COCKTAILS

CATALOG #15309

In addition to our standard RosetteSep® cocktails, custom cocktails may be easily prepared to meet your unique cell separation needs. RosetteSep® custom cocktails have been used by researchers to enrich various cell subsets, such as: **T cells**[5], **naïve**, **memory**, or **resting T cells**, **dendritic cells**, etc.

Anti-Human Antibodies Available For Use in Custom Cocktails
CD2, CD3, CD4, CD5, CD8, CD10, CD11b, CD14, CD15, CD16, CD19, CD20, CD24, CD25, CD27, CD29, CD33, CD34, CD36, CD38, CD41, CD45, CD45RA, CD45RO, CD56, CD66b, CD66e, CD69, CD124, HLA-DR, IgE, breast carcinoma, and TCR.
Other antibodies are available upon request.

RosetteSep® is an extremely flexible system, which can also be used with your own "in-house" IgG_1 mouse monoclonal antibodies.

Design your own custom cocktails or contact us for assistance in optimizing your cell separations.

SELECTED RosetteSep® PUBLICATIONS

(WITH REPORTED PURITIES WHERE AVAILABLE)

1. Vivier *et al*., **Blood** 111: 5008-5016, 2008. **NK cell** enrichment for functional studies.
2. Neil *et al*., **Nature** 451: 425-430, 2008. **$CD4^+$ T cell** enrichment for functional HIV studies. Purity >90%.
3. Cobb *et al*., **Proc Natl Acad Sci USA** 102: 4801-4806, 2005. **T cell** and **monocyte** enrichment for microarray analysis. Purity 80-95%.
4. Rouhianinen *et al*., **Blood** 104: 1174-1182, 2004. **Monocyte** enrichment for cell migration and RT-PCR studies.
5. Sasaki *et al*., **Blood** 105: 1204-1213, 2005. **$CD4^+$ T cell** enrichment for microarray analysis. Purity >90%.
6. Kohler *et al*., **J Leuko Biol** 73: 407-416, 2003. **Monocyte** enrichment for culture and differentiation into macrophages
7. Dyugovskaya *et al.*, **Am J Respir Crit Care Med** 168: 242-249, 2003. **γδ T cell** enrichment for functional and molecular studies.
8. Poggi *et al*., **J Immunol** 174: 2653-2660, 2005. **NK cell** enrichment for functional and molecular studies.
9. Frelin *et al*., **Blood** 105: 804-811, 2005. **Hematopoietic progenitor cell** enrichment for cytotoxicity studies.
10. Castriconi *et al*., **Proc Natl Acad Sci USA** 101: 12640-12645, 2004. **Neuroblastoma cell** enrichment from bone marrow for molecular characterization studies; **NK cell** enrichment for functional studies.
11. Parsons *et al*., **Blood** 104: 2736-2738, 2004. **Mesenchymal stem cell** enrichment from fetal bone marrow for culture and virus susceptibility studies. Purity >99% after 4 days culture.
12. Vasir *et al*., **J Immunol** 174: 2376-2386, 2005. **T cell** and **B cell** enrichment for cytokine activation studies. Purity 95-97% (T cell), >90% (B cells).

SELECTED ASHI ABSTRACTS FOR HLA ANALYSIS

1. Dunn DM, Thurmon MN, Sypert CL: Cell preparation that can be used for serological **HLA typing**, crossmatching, and flow crossmatching. ASHI Abstract #79, 2003
2. Gautreaux MD, Haywood MJ, James CM, White CD: Evaluation of RosetteSep® with modification of test protocol to increase yield and reduce red blood cell contamination. ASHI Abstract #120, 2003
3. Martin C, McKie J, Hazy L, Shumway W, LeFor W: Purified **T** and **B cell** preparations obtained using RosetteSep cell isolation reagents: suitability for use in cytotoxic assays. ASHI Abstract #96, 2002

CATALOG # 28435 | VERSION # 3.0.0 | AUGUST 2008

ONE-STEP CELL ENRICHMENT DIRECTLY FROM WHOLE BLOOD

ROSETTESEP® FEATURES

HIGH RECOVERY
No post-Ficoll™ cell losses.

NEGATIVE SELECTION
Cells are unlabeled and ready for immediate use.

UNTOUCHED CELLS
Yield high-quality RNA and DNA for molecular studies.[3-5]

FLEXIBLE
Process large or small volumes and multiple samples simultaneously.

SAFE
Minimal sample handling.

SIMPLE. FAST. EASY.

- **No Magnets**
- **No Columns**
- **No Special Equipment**

Just a 20 minute incubation at room temperature prior to a standard Ficoll™ spin.

KITS AVAILABLE FOR:

T cells, $CD4^+$ T cells, $CD8^+$ T cells, B cells, Total lymphocytes, Multiple myeloma cells, Monocytes, Progenitors, Circulating epithelial cells, Granulocytes, Mesenchymal stem cells, and more...

PLUS DEPLETION OF:

Granulocytes, Monocytes, IgE-bearing cells, T cells & subsets.

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POWERFUL CELL SEPARATION WITH A SIMPLE SPIN

WHAT IS RosetteSep® ?

RosetteSep® is a rapid cell separation procedure for the isolation of highly purified cells **directly** from **human whole blood** (Figure 1). RosetteSep® turns a **simple density centrifugation** step into a specific antibody-mediated cell enrichment procedure with STEMCELL's tetrameric antibody complex (TAC) technology (Figure 3). The RosetteSep® cocktail **crosslinks unwanted cells to multiple red blood cells** already present in the sample, forming immunorosettes (Figure 2 & 3). When centrifuged over the appropriate density medium (e.g. Ficoll™), the **unwanted (rosetted)** cells pellet along with the red blood cells, leaving the **desired cells untouched** and **highly enriched** at the density medium: plasma interface (Figure 1). Desired cells are never labeled with antibody and are immediately ready for any application.

FIGURE 1: RosetteSep® Procedure

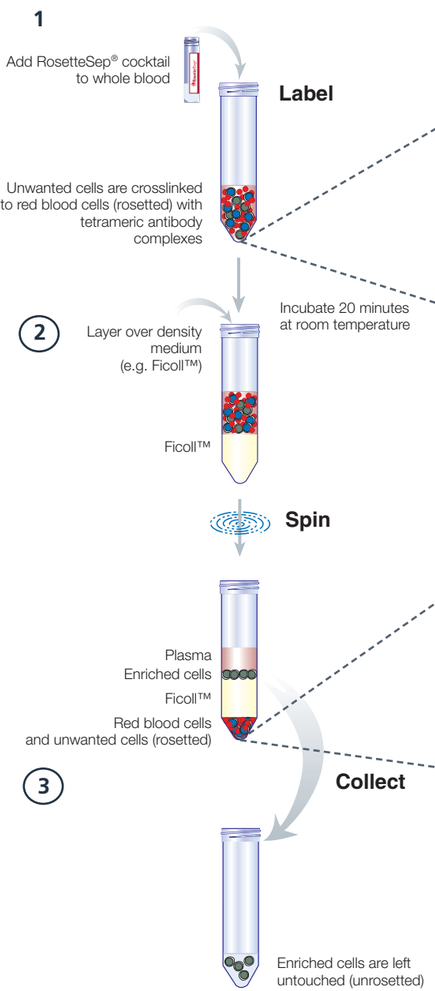


FIGURE 2: Picture of a Blood Sample After Addition of the RosetteSep® Cocktail, and Prior to Centrifugation Over Ficoll™. Magnification 400X

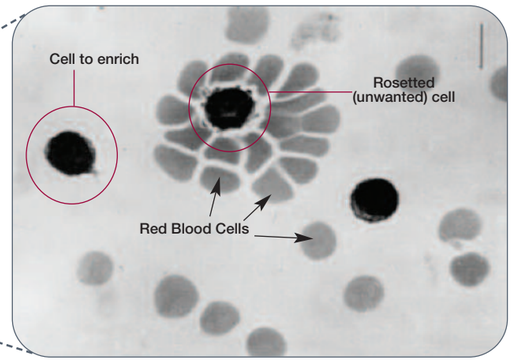
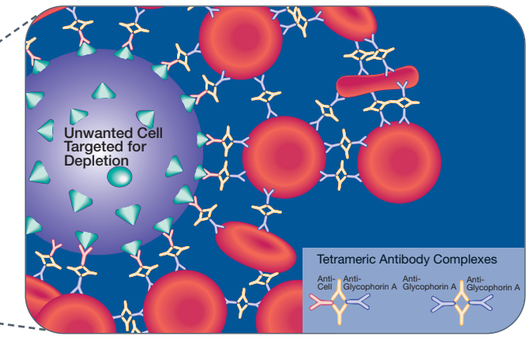


FIGURE 3: Illustration Showing Rosette of Unwanted Cell and RBCs Formed by RosetteSep® Tetrameric Antibody Complexes



Ask us about a RosetteSep® demonstration in your lab!

Ficoll™ and Ficoll-Paque™ PLUS are trademarks of GE HealthCare Ltd.

EXAMPLES OF RosetteSep® APPLICATIONS

COCKTAILS CAN BE USED DIRECTLY WITH BD VACUTAINER® CPT™ - CELL PREPARATION TUBES

BD Vacutainer® CPT™ - Cell Preparation Tubes* are evacuated blood collection tubes, containing a density gradient liquid below a gel insert, and an anticoagulant above. The **RosetteSep® procedure can be performed directly in the CPT, minimizing sample manipulation**. The gel insert in the CPT keeps the sample and the density gradient layer apart before and after centrifugation, avoiding the layering step and facilitating removal of the enriched cells. To perform a RosetteSep® separation in a CPT, the RosetteSep® cocktail is added to the blood sample directly in the CPT. After incubation and centrifugation, the enriched cells are recovered by pipetting or pouring from the CPT. This approach may be advantageous when minimal sample handling is preferred, such as when processing infectious samples.

*Available from BD (www.vmdp.com) BD Vacutainer® and CPT™ are trademarks of Becton, Dickinson and Company.

ISOLATE SPECIFIC T CELL SUBSETS:

EXAMPLE – REGULATORY $CD4^+CD25^+$ T CELLS

CATALOG #15862

To isolate $CD4^+CD25^+$ T cells, first enrich $CD4^+$ T cells with RosetteSep®, then select $CD4^+CD25^+$ T cells using EasySep® CD25 Selection Cocktail (immunomagnetic cell selection without columns). Activated non-$CD4^+$ T cells are removed during the RosetteSep® procedure prior to CD25 positive selection. For more information on EasySep®, please visit http://www.stemcell.com/product_catalog/easysep.aspx.

WORKS WITH ANY RED BLOOD CELL CONTAINING SAMPLE

RosetteSep® can be used with samples other than whole blood. With the appropriate procedure, cells can be enriched from **buffy coat**, **bone marrow**, **cord blood**, **leukapheresis**, and **spleen**.

QUICK AND EASY GRANULOCYTE DEPLETION

CATALOG #15624

RosetteSep® Granulocyte Depletion reagent can be used to **eliminate granulocytes** from older blood samples.

SAFE HANDLING FOR HIV RESEARCH

HIV research often requires cell isolation procedures that **minimize sample handling**. RosetteSep® is a **safe** and easy to use tool for the separation of whole blood **with minimal sample handling** that **avoids cross-contamination** of samples and **minimizes exposure to virus**.[2]

ISOLATE CELLS FOR MACROPHAGE RESEARCH

CATALOG #15624

Cell separation with RosetteSep® produces **unlabelled** cells that can be used in any application. **Monocytes** isolated with RosetteSep® (Catalog #15028) are **untouched** and immediately ready to be **differentiated** into **macrophages**.[6]

ISOLATE CELLS FOR HLA ANALYSIS

After RosetteSep® enrichment, cells are **immediately usable** for serological **HLA testing**, **chimerism** and **flow crossmatch analysis**. Because RosetteSep® does not interfere with subsequent analysis and is **gentle** on cells, this procedure can reduce the risk of false positive data in HLA applications.

KITS FOR SPECIALIZED ROSETTESEP® APPLICATIONS

LYMPHOID & MYELOID ENRICHMENT KITS FOR LINEAGE-SPECIFIC CHIMERISM ANALYSIS

CATALOG #15271HLA (Lymphoid)
CATALOG #15272HLA (Myeloid)

These kits for monitoring engraftment after transplants provide sufficient enrichment cocktail and specially designed density medium to perform 20 tests.

CORD BLOOD PROGENITOR ENRICHMENT KIT

CATALOG #15276

This kit allows the routine enrichment of hematopoietic progenitors from large volumes of cord blood samples. One kit can process up to 500 mL of cord blood.